



Docket No.: M4065.0564/P564-A  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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In re Patent Application of:  
John T. Moore et al.

Application No.: Not Yet Assigned

Filed: March 1, 2004

Art Unit: Not Yet Assigned

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For: GRADED  $GE_xSE_{100-x}$  CONCENTRATION  
IN PCRAM      Examiner: Not Yet Assigned

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**INFORMATION DISCLOSURE STATEMENT (IDS)**

MS Patent Application  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 CFR 1.56, 1.97 and 1.98, the attention of the Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement accompanies the new patent application submitted herewith.

Copies of the references on the PTO/SB/08 are not provided.

Those patent(s) or publication(s) which are marked with a double asterisk (\*\*) next to the Cite No. in the attached form PTO/SB/08 are not supplied because they were previously cited by or submitted to the Office in a prior application

number 10/230,327, filed August 29, 2002 and relied upon in this application for an earlier filing date under 35 U.S.C. 120.

The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 04-1073, under Order No. M4065.0564/P564-A. A duplicate copy of this paper is enclosed.

Dated: March 1, 2004

Respectfully submitted,

By 

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Approved for use through 10/31/2002. OMB 0651-0031

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## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet	1	of	8	Attorney Docket Number	M4065.0564/P564-A
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### U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
AA	5,761,115		06/02/1998	Kozicki et al. **	
AB	6,084,796		07/04/2000	Kozicki et al. **	
AC	5,914,893		06/22/1999	Kozicki et al. **	
AD	5,896,312		04/20/1999	Kozicki et al. **	
AE	6,388,324		05/14/2002	Kozicki et al. **	
AF	US 2002/0000666		01/03/2002	Kozicki et al. **	
AG	5,500,532		03/19/1996	Kozicki et al. **	
AH	6,418,049		07/09/2002	Kozicki et al. **	
AI	5,751,012		05/12/1998	Wolstenholme et al. **	
AJ	5,789,277		08/04/1998	Zahorik et al. **	
AK	6,348,365		02/19/2002	Moore et al. **	
AL	US 2002/0168820		11/14/2002	Kozicki et al. **	
AM	6,469,364		10/22/2002	Kozicki **	

### FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>3</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known)				
BA	WO 02/21542		03/14/2002	Kozicki et al. **		
BB	WO 00/48196		08/17/2000	Kozicki et al. **		
BC	WO 97/48032		12/18/1997	Kozicki et al. **		
BD	WO 99/28914		06/10/1999	Kozicki et al. **		

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Substitute for form 1449B/PTO				Complete If Known	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(use as many sheets as necessary)</i>				Application Number	Not Yet Assigned
Sheet	2	of	8	Filing Date	March 1, 2004
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				Group Art Unit	Not Yet Assigned
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				Attorney Docket Number	M4065.0564/P564-A

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS					
Examiner Initials	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, page(s), volume-issue number(s), publisher, city and/or country where published.			T <sup>2</sup>
CA	Abdel-All, A.; Elshafie,A.; Elhawary, M.M., DC electric-field effect in bulk and thin-film Ge5As38Te57 chalcogenide glass, Vacuum 59 (2000) 845-853. **				
CB	Adler, D.; Moss, S.C., Amorphous memories and bistable switches, J. Vac. Sci. Technol. 9 (1972) 1182-1189. **				
CC	Adler, D.; Henisch, H.K.; Mott, S.N., The mechanism of threshold switching in amorphous alloys, Rev. Mod. Phys. 50 (1978) 209-220. **				
CD	Afifi, M.A.; Labib, H.H.; El-Fazary, M.H.; Fadel, M., Electrical and thermal properties of chalcogenide glass system Se75Ge25-xSbx, Appl. Phys. A 55 (1992) 167-169. **				
CE	Afifi,M.A.; Labib, H.H.; Fouad, S.S.; El-Shazly, A.A., Electrical & thermal conductivity of the amorphous semiconductor GexSe1-x, Egypt, J. Phys. 17 (1986) 335-342. **				
CF	Alekperova, Sh.M.; Gadzhieva, G.S., Current-Voltage characteristics of Ag2Se single crystal near the phase transition, Inorganic Materials 23 (1987) 137-139. **				
CG	Aleksiejunas, A.; Cesnys, A., Switching phenomenon and memory effect in thin-film heterojunction of polycrystalline selenium-silver selenide, Phys. Stat. Sol. (a) 19 (1973) K169-K171. **				
CH	Angell, C.A., Mobile ions in amorphous solids, Annu. Rev. Phys. Chem. 43 (1992) 693-717. **				
CI	Aniya, M., Average electronegativity, medium-range-order, and ionic conductivity in superionic glasses, Solid state Ionics 136-137 (2000) 1085-1089. **				
CJ	Asahara, Y.; Izumitani, T., Voltage controlled switching in Cu-As-Se compositions, J. Non-Cryst. Solids 11 (1972) 97-104. **				
CK	Asokan, S.; Prasad, M.V.N.; Parthasarathy, G.; Gopal, E.S.R., Mechanical and chemical thresholds in IV-VI chalcogenide glasses, Phys. Rev. Lett. 62 (1989) 808-810. **				
CL	Baranovskii, S.D.; Cordes, H., On the conduction mechanism in ionic glasses, J. Chem. Phys. 111 (1999) 7546-7557. **				
CM	Belin, R.; Taillades, G.; Pradel, A.; Ribes, M., Ion dynamics in superionic chalcogenide glasses: complete conductivity spectra, Solid state Ionics 136-137 (2000) 1025-1029. **				
CN	Belin, R.; Zerouale, A.; Pradel, A.; Ribes, M., Ion dynamics in the argyrodite compound Ag7GeSe5I: non-Arrhenius behavior and complete conductivity spectra, Solid State Ionics 143 (2001) 445-455. **				
CO	Benmore, C.J.; Salmon, P.S., Structure of fast ion conducting and semiconducting glassy chalcogenide alloys, Phys. Rev. Lett. 73 (1994) 264-267. **				
CP	Bernede, J.C., Influence du metal des electrodes sur les caracteristiques courant-tension des structures M-Ag2Se-M, Thin solid films 70 (1980) L1-L4. **				
CQ	Bernede, J.C., Polarized memory switching in MIS thin films, Thin Solid Films 81 (1981) 155-160. **				
CR	Bernede, J.C., Switching and silver movements in Ag2Se thin films, Phys. Stat. Sol. (a) 57 (1980) K101-K104. **				
CS	Bernede, J.C.; Abachi, T., Differential negative resistance in metal/insulator/metal structures with an upper bilayer electrode, Thin solid films 131 (1985) L61-L64. **				
CT	Bernede, J.C.; Conan, A.; Fousenant, E.; El Bouchairi, B.; Goureaux, G., Polarized memory switching effects in Ag2Se/Se/M thin film sandwiches, Thin solid films 97 (1982) 165-171. **				
CU	Bernede, J.C.; Khelil, A.; Kettaf, M.; Conan, A., Transition from S- to N-type differential negative resistance in Al-Al2O3-Ag2-xSe1+x thin film structures, Phys. Stat. Sol. (a) 74 (1982) 217-224. **				
CV	Bondarev, V.N.; Pikhitsa, P.V., A dendrite model of current instability in RbAg4I5, Solid State Ionics 70/71 (1994) 72-76. **				
CW	Boolchand, P., The maximum in glass transition temperature (Tg) near x=1/3 in GexSe1-x				



PTO/SB/08B (10-01)

Approved for use through 10/31/2002. OMB 0651-0031

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Sheet 3 of 8 Attorney Docket Number M4065.0564/P564-A

	Glasses, Asian Journal of Physics (2000) 9, 709-72. **
CX	Boolchand, P.; Bresser, W.J., Mobile silver ions and glass formation in solid electrolytes, Nature 410 (2001) 1070-1073. **
CY	Boolchand, P.; Georgiev, D.G.; Goodman, B., Discovery of the Intermediate Phase in Chalcogenide Glasses, J. Optoelectronics and Advanced Materials, 3 (2001), 703 **
CZ	Boolchand, P.; Selvanathan, D.; Wang, Y.; Georgiev, D.G.; Bresser, W.J., Onset of rigidity in steps in chalcogenide glasses, Properties and Applications of Amorphous Materials, M.F. Thorpe and Tichy, L. (eds.) Kluwer Academic Publishers, the Netherlands, 2001, pp. 97-132. **
CA1	Boolchand, P.; Enzweiler, R.N.; Tenhover, M., Structural ordering of evaporated amorphous chalcogenide alloy films: role of thermal annealing, Diffusion and Defect Data Vol. 53-54 (1987) 415-420. **
CB1	Boolchand, P.; Grothaus, J.; Bresser, W.J.; Suranyi, P., Structural origin of broken chemical order in a GeSe2 glass, Phys. Rev. B 25 (1982) 2975-2978. **
CC1	Boolchand, P.; Grothaus, J.; Phillips, J.C., Broken chemical order and phase separation in GexSe1-x glasses, Solid state comm. 45 (1983) 183-185. **
CD1	Boolchand, P.; Bresser, W.J., Compositional trends in glass transition temperature (Tg), network connectivity and nanoscale chemical phase separation in chalcogenides, Dept. of ECECS, Univ. Cincinnati (October 28, 1999) 45221-0030. **
CE1	Boolchand, P.; Grothaus, J., Molecular Structure of Melt-Quenched GeSe2 and GeS2 glasses compared, Proc. Int. Conf. Phys. Semicond. (Eds. Chadi and Harrison) 17 <sup>th</sup> (1985) 833-36. **
CF1	Bresser, W.; Boolchand, P.; Suranyi, P., Rigidity percolation and molecular clustering in network glasses, Phys. Rev. Lett. 56 (1986) 2493-2496. **
CG1	Bresser, W.J.; Boolchand, P.; Suranyi, P.; de Neufville, J.P., Intrinsically broken chalcogen chemical order in stoichiometric glasses, Journal de Physique 42 (1981) C4-193-C4-196. **
CH1	Bresser, W.J.; Boolchand, P.; Suranyi, P.; Hernandez, J.G., Molecular phase separation and cluster size in GeSe2 glass, Hyperfine Interactions 27 (1986) 389-392. **
CI1	Cahen, D.; Gilet, J.-M.; Schmitz, C.; Chemayak, L.; Gartsman, K.; Jakubowicz, A., Room-Temperature, electric field induced creation of stable devices in CuInSe2 Crystals, Science 258 (1992) 271-274. **
CJ1	Chatterjee, R.; Asokan, S.; Titus, S.S.K., Current-controlled negative-resistance behavior and memory switching in bulk As-Te-Se glasses, J. Phys. D: Appl. Phys. 27 (1994) 2624-2627. **
CK1	Chen, C.H.; Tai, K.L., Whisker growth induced by Ag photodoping in glassy GexSe1-x films, Appl. Phys. Lett. 37 (1980) 1075-1077. **
CL1	Chen, G.; Cheng, J., Role of nitrogen in the crystallization of silicon nitride-doped chalcogenide glasses, J. Am. Ceram. Soc. 82 (1999) 2934-2936. **
CM1	Chen, G.; Cheng, J.; Chen, W., Effect of Si3N4 on chemical durability of chalcogenide glass, J. Non-Cryst. Solids 220 (1997) 249-253. **
CN1	Cohen, M.H.; Neale, R.G.; Paskin, A., A model for an amorphous semiconductor memory device, J. Non-Cryst. Solids 8-10 (1972) 885-891. **
CO1	Croitoru, N.; Lazarescu, M.; Popescu, C.; Telnic, M.; and Vescan, L., Ohmic and non-ohmic conduction in some amorphous semiconductors, J. Non-Cryst. Solids 8-10 (1972) 781-786. **
CP1	Dalven, R.; Gill, R., Electrical properties of beta-Ag2Te and beta-Ag2Se from 4.2 to 300K, J. Appl. Phys. 38 (1967) 753-756. **
CQ1	Davis, E.A., Semiconductors without form, Search 1 (1970) 152-155. **
CR1	Dearnaley, G.; Stoneham, A.M.; Morgan, D.V., Electrical phenomena in amorphous oxide films, Rep. Prog. Phys. 33 (1970) 1129-1191. **
CS1	Dejus, R.J.; Susman, S.; Volin, K.J.; Montague, D.G.; Price, D.L., Structure of Vitreous Ag-Ge-Se, J. Non-Cryst. Solids 143 (1992) 162-180. **
CT1	den Boer, W., Threshold switching in hydrogenated amorphous silicon, Appl. Phys. Lett. 40 (1982) 812-813. **
CU1	Drusedau, T.P.; Panckow, A.N.; Klabunde, F., The hydrogenated amorphous



PTO/SB/08B (10-01)

Approved for use through 10/31/2002. OMB 0651-0031

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	silicon/nanodisperse metal (SIMAL) system-Films of unique electronic properties, J. Non-Cryst. Solids 198-200 (1996) 829-832. **
CV1	El Bouchairi, B.; Bernede, J.C.; Burgaud, P., Properties of Ag <sub>2-x</sub> Se <sub>1+x</sub> /n-Si diodes, Thin Solid Films 110 (1983) 107-113. **
CW1	El Gharra, Z.; Bourahla, A.; Vautier, C., Role of photoinduced defects in amorphous Ge <sub>x</sub> Se <sub>1-x</sub> photoconductivity, J. Non-Cryst. Solids 155 (1993) 171-179. **
CX1	El Ghundi, R.; Calas, J.; Galibert, G.; Averous, M., Silver photodissolution in amorphous chalcogenide thin films, Thin Solid Films 218 (1992) 259-273. **
CY1	El Ghundi, R.; Calas, J.; Galibert, G., Ag dissolution kinetics in amorphous GeSe <sub>5.5</sub> thin films from "in-situ" resistance measurements vs time, Phys. Stat. Sol. (a) 123 (1991) 451-460. **
CZ1	El-kady, Y.L., The threshold switching in semiconducting glass Ge <sub>21</sub> Se <sub>17</sub> Te <sub>62</sub> , Indian J. Phys. 70A (1996) 507-516. **
CA2	Elliott, S.R., A unified mechanism for metal photodissolution in amorphous chalcogenide materials, J. Non-Cryst. Solids 130 (1991) 85-97. **
CB2	Elliott, S.R., Photodissolution of metals in chalcogenide glasses: A unified mechanism, J. Non-Cryst. Solids 137-138 (1991) 1031-1034. **
CC2	Elsamanoudy, M.M.; Hegab, N.A.; Fadel, M., Conduction mechanism in the pre-switching state of thin films containing Te As Ge Si, Vacuum 46 (1995) 701-707. **
CD2	El-Zahed, H.; El-Korashy, A., Influence of composition on the electrical and optical properties of Ge <sub>20</sub> BixSe <sub>80-x</sub> films, Thin Solid Films 376 (2000) 236-240. **
CE2	Fadel, M., Switching phenomenon in evaporated Se-Ge-As thin films of amorphous chalcogenide glass, Vacuum 44 (1993) 851-855. **
CF2	Fadel, M.; El-Shair, H.T., Electrical, thermal and optical properties of Se <sub>75</sub> Ge <sub>7</sub> Sb <sub>18</sub> , Vacuum 43 (1992) 253-257. **
CG2	Feng, X.; Bresser, W.J.; Boolchand, P., Direct evidence for stiffness threshold in Chalcogenide glasses, Phys. Rev. Lett. 78 (1997) 4422-4425. **
CH2	Feng, X.; Bresser, W.J.; Zhang, M.; Goodman, B.; Boolchand, P., Role of network connectivity on the elastic, plastic and thermal behavior of covalent glasses, J. Non-Cryst. Solids 222 (1997) 137-143. **
CI2	Fischer-Colbrie, A.; Bienenstock, A.; Fuoss, P.H.; Marcus, M.A., Structure and bonding in photodiffused amorphous Ag-GeSe <sub>2</sub> thin films, Phys. Rev. B 38 (1988) 12388-12403. **
CJ2	Fleury, G.; Hamou, A.; Viger, C.; Vautier, C., Conductivity and crystallization of amorphous selenium, Phys. Stat. Sol. (a) 64 (1981) 311-316. **
CK2	Fritzsche, H., Optical and electrical energy gaps in amorphous semiconductors, J. Non-Cryst. Solids 6 (1971) 49-71. **
CL2	Fritzsche, H., Electronic phenomena in amorphous semiconductors, Annual Review of Materials Science 2 (1972) 697-744. **
CM2	Gates, B.; Wu, Y.; Yin, Y.; Yang, P.; Xia, Y., Single-crystalline nanowires of Ag <sub>2</sub> Se can be synthesized by templating against nanowires of trigonal Se, J. Am. Chem. Soc. (2001) currently ASAP. **
CN2	Gosain, D.P.; Nakamura, M.; Shimizu, T.; Suzuki, M.; Okano, S., Nonvolatile memory based on reversible phase transition phenomena in telluride glasses, Jap. J. Appl. Phys. 28 (1989) 1013-1018. **
CO2	Guin, J.-P.; Rouxel, T.; Kervyn, V.; Sangleboeuf, J.-C.; Serre, I.; Lucas, J., Indentation creep of Ge-Se chalcogenide glasses below T <sub>g</sub> : elastic recovery and non-Newtonian flow, J. Non-Cryst. Solids 298 (2002) 260-269. **
CP2	Guin, J.-P.; Rouxel, T.; Sangleboeuf, J.-C.; Melscoet, I.; Lucas, J., Hardness, toughness, and scratchability of germanium-selenium chalcogenide glasses, J. Am. Ceram. Soc. 85 (2002) 1545-52. **
CQ2	Gupta, Y.P., On electrical switching and memory effects in amorphous chalcogenides, J. Non-Cryst. Sol. 3 (1970) 148-154. **



PTO/SB/08B (10-01)

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CR2	Haberland, D.R.; Stiegler, H., New experiments on the charge-controlled switching effect in amorphous semiconductors, <i>J. Non-Cryst. Solids</i> 8-10 (1972) 408-414. **
CS2	Haifz, M.M.; Ibrahim, M.M.; Dongol, M.; Hammad, F.H., Effect of composition on the structure and electrical properties of As-Se-Cu glasses, <i>J. Appl. Phys.</i> 54 (1983) 1950-1954. **
CT2	Hajto, J.; Rose, M.J.; Osborne, I.S.; Snell, A.J.; Le Comber, P.G.; Owen, A.E., Quantization effects in metal/a-Si:H/metal devices, <i>Int. J. Electronics</i> 73 (1992) 911-913. **
CU2	Hajto, J.; Hu, J.; Snell, A.J.; Turvey, K.; Rose, M., DC and AC measurements on metal/a-Si:H/metal room temperature quantised resistance devices, <i>J. Non-Cryst. Solids</i> 266-269 (2000) 1058-1061. **
CV2	Hajto, J.; McAuley, B.; Snell, A.J.; Owen, A.E., Theory of room temperature quantized resistance effects in metal-a-Si:H-metal thin film structures, <i>J. Non-Cryst. Solids</i> 198-200 (1996) 825-828. **
CW2	Hajto, J.; Owen, A.E.; Snell, A.J.; Le Comber, P.G.; Rose, M.J., Analogue memory and ballistic electron effects in metal-amorphous silicon structures, <i>Phil. Mag. B</i> 63 (1991) 349-369. **
CX2	Hayashi, T.; Ono, Y.; Fukaya, M.; Kan, H., Polarized memory switching in amorphous Se film, <i>Japan. J. Appl. Phys.</i> 13 (1974) 1163-1164. **
CY2	Hegab, N.A.; Fadel, M.; Sedeek, K., Memory switching phenomena in thin films of chalcogenide semiconductors, <i>Vacuum</i> 45 (1994) 459-462. **
CZ2	Hirose, Y.; Hirose, H., Polarity-dependent memory switching and behavior of Ag dendrite in Ag-photodoped amorphous As <sub>2</sub> S <sub>3</sub> films, <i>J. Appl. Phys.</i> 47 (1976) 2767-2772. **
CA3	Hong, K.S.; Speyer, R.F., Switching behavior in II-IV-V <sub>2</sub> amorphous semiconductor systems, <i>J. Non-Cryst. Solids</i> 116 (1990) 191-200. **
CB3	Hosokawa, S., Atomic and electronic structures of glassy Ge <sub>x</sub> Se <sub>1-x</sub> around the stiffness threshold composition, <i>J. Optoelectronics and Advanced Materials</i> 3 (2001) 199-214. **
CC3	Hu, J.; Snell, A.J.; Hajto, J.; Owen, A.E., Constant current forming in Cr/p+a-Si:H/V thin film devices, <i>J. Non-Cryst. Solids</i> 227-230 (1998) 1187-1191. **
CD3	Hu, J.; Hajto, J.; Snell, A.J.; Owen, A.E.; Rose, M.J., Capacitance anomaly near the metal-non-metal transition in Cr-hydrogenated amorphous Si-V thin-film devices, <i>Phil. Mag. B</i> 74 (1996) 37-50. **
CE3	Hu, J.; Snell, A.J.; Hajto, J.; Owen, A.E., Current-induced instability in Cr-p+a-Si:H-V thin film devices, <i>Phil. Mag. B</i> 80 (2000) 29-43. **
CF3	Iizima, S.; Sugi, M.; Kikuchi, M.; Tanaka, K., Electrical and thermal properties of semiconducting glasses As-Te-Ge, <i>Solid State Comm.</i> 8 (1970) 153-155. **
CG3	Ishikawa, R.; Kikuchi, M., Photovoltaic study on the photo-enhanced diffusion of Ag in amorphous films of Ge <sub>2</sub> S <sub>3</sub> , <i>J. Non-Cryst. Solids</i> 35 & 36 (1980) 1061-1066. **
CH3	Iyetomi, H.; Vashishta, P.; Kalia, R.K., Incipient phase separation in Ag/Ge/Se glasses: clustering of Ag atoms, <i>J. Non-Cryst. Solids</i> 262 (2000) 135-142. **
CI3	Jones, G.; Collins, R.A., Switching properties of thin selenium films under pulsed bias, <i>Thin Solid Films</i> 40 (1977) L15-L18. **
CJ3	Joullie, A.M.; Marucchi, J., On the DC electrical conduction of amorphous As <sub>2</sub> Se <sub>7</sub> before switching, <i>Phys. Stat. Sol. (a)</i> 13 (1972) K105-K109. **
CK3	Joullie, A.M.; Marucchi, J., Electrical properties of the amorphous alloy As <sub>2</sub> Se <sub>5</sub> , <i>Mat. Res. Bull.</i> 8 (1973) 433-442. **
CL3	Kaplan, T.; Adler, D., Electrothermal switching in amorphous semiconductors, <i>J. Non-Cryst. Solids</i> 8-10 (1972) 538-543. **
CM3	Kawaguchi, T.; Maruno, S.; Elliott, S.R., Optical, electrical, and structural properties of amorphous Ag-Ge-S and Ag-Ge-Se films and comparison of photoinduced and thermally induced phenomena of both systems, <i>J. Appl. Phys.</i> 79 (1996) 9096-9104. **
CN3	Kawaguchi, T.; Masui, K., Analysis of change in optical transmission spectra resulting from Ag photodoping in chalcogenide film, <i>Jpn. J. Appl. Phys.</i> 26 (1987) 15-21. **
CO3	Kawasaki, M.; Kawamura, J.; Nakamura, Y.; Aniya, M., Ionic conductivity of Agx(GeSe <sub>3</sub> ) <sub>1-x</sub>



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Application Number Not Yet Assigned

Filing Date March 1, 2004

First Named Inventor John T. Moore

Group Art Unit Not Yet Assigned

Examiner Name Not Yet Assigned

Attorney Docket Number M4065.0564/P564-A

	(0<=x<=0.571) glasses, Solid state Ionics 123 (1999) 259-269. **	
CP3	Kluge, G.; Thomas, A.; Klubes, R.; Grotzschel, R., Silver photodiffusion in amorphous GeSe100-x, J. Non-Cryst. Solids 124 (1990) 186-193. **	
CQ3	Kolobov, A.V., On the origin of p-type conductivity in amorphous chalcogenides, J. Non-Cryst. Solids 198-200 (1996) 728-731. **	
CR3	Kolobov, A.V., Lateral diffusion of silver in vitreous chalcogenide films, J. Non-Cryst. Solids 137-138 (1991) 1027-1030. **	
CS3	Korkinova, Ts.N.; Andreichin, R.E., Chalcogenide glass polarization and the type of contacts, J. Non-Cryst. Solids 194 (1996) 256-259. **	
CT3	Kotkata, M.F.; Afif, M.A.; Labib, H.H.; Hegab, N.A.; Abdel-Aziz, M.M., Memory switching in amorphous GeSeTi chalcogenide semiconductor films, Thin Solid Films 240 (1994) 143-146. **	
CU3	Lakshminarayana, K.N.; Srivastava, K.K.; Panwar, O.S.; Dumar, A., Amorphous semiconductor devices: memory and switching mechanism, J. Instn Electronics & Telecom. Engrs 27 (1981) 16-19. **	
CV3	Lal, M.; Goyal, N., Chemical bond approach to study the memory and threshold switching chalcogenide glasses, Indian Journal of pure & appl. phys. 29 (1991) 303-304. **	
CW3	Leimer, F.; Stotzel, H.; Kottwitz, A., Isothermal electrical polarisation of amorphous GeSe films with blocking Al contacts influenced by Poole-Frenkel conduction, Phys. Stat. Sol. (a) 29 (1975) K129-K132. **	
CX3	Leung, W.; Cheung, N.; Neureuther, A.R., Photoinduced diffusion of Ag in GeSe1-x glass, Appl. Phys. Lett. 46 (1985) 543-545. **	
CY3	Matsushita, T.; Yamagami, T.; Okuda, M., Polarized memory effect observed on Se-SnO <sub>2</sub> system, Jap. J. Appl. Phys. 11 (1972) 1657-1662. **	
CZ3	Matsushita, T.; Yamagami, T.; Okuda, M., Polarized memory effect observed on amorphous selenium thin films, Jpn. J. Appl. Phys. 11 (1972) 606. **	
CA4	Mazurier, F.; Levy, M.; Souquet, J.L., Reversible and irreversible electrical switching in TeO <sub>2</sub> -V <sub>2</sub> O <sub>5</sub> based glasses, Journal de Physique IV 2 (1992) C2-185 - C2-188. **	
CB4	Messoussi, R.; Bernede, J.C.; Benhida, S.; Abachi, T.; Latef, A., Electrical characterization of M/Se structures (M=Ni,Bi), Mat. Chem. And Phys. 28 (1991) 253-258. **	
CC4	Mitkova, M.; Boolchand, P., Microscopic origin of the glass forming tendency in chalcogenides and constraint theory, J. Non-Cryst. Solids 240 (1998) 1-21. **	
CD4	Mitkova, M.; Kozicki, M.N., Silver incorporation in Ge-Se glasses used in programmable metallization cell devices, J. Non-Cryst. Solids 299-302 (2002) 1023-1027. **	
CE4	Mitkova, M.; Wang, Y.; Boolchand, P., Dual chemical role of Ag as an additive in chalcogenide glasses, Phys. Rev. Lett. 83 (1999) 3848-3851. **	
CF4	Miyatani, S.-y., Electronic and ionic conduction in (Ag <sub>x</sub> Cu <sub>1-x</sub> ) <sub>2</sub> Se, J. Phys. Soc. Japan 34 (1973) 423-432. **	
CG4	Miyatani, S.-y., Electrical properties of Ag <sub>2</sub> Se, J. Phys. Soc. Japan 13 (1958) 317. **	
CH4	Miyatani, S.-y., Ionic conduction in beta-Ag <sub>2</sub> Te and beta-Ag <sub>2</sub> Se, Journal Phys. Soc. Japan 14 (1959) 996-1002. **	
CI4	Mott, N.F., Conduction in glasses containing transition metal ions, J. Non-Cryst. Solids 1 (1968) 1-17. **	
CJ4	Nakayama, K.; Kitagawa, T.; Ohmura, M.; Suzuki, M., Nonvolatile memory based on phase transitions in chalcogenide thin films, Jpn. J. Appl. Phys. 32 (1993) 564-569. **	
CK4	Nakayama, K.; Kojima, K.; Hayakawa, F.; Imai, Y.; Kitagawa, A.; Suzuki, M., Submicron nonvolatile memory cell based on reversible phase transition in chalcogenide glasses, Jpn. J. Appl. Phys. 39 (2000) 6157-6161. **	
CL4	Nang, T.T.; Okuda, M.; Matsushita, T.; Yokota, S.; Suzuki, A., Electrical and optical parameters of GeSe1-x amorphous thin films, Jap. J. App. Phys. 15 (1976) 849-853. **	
CM4	Narayanan, R.A.; Asokan, S.; Kumar, A., Evidence concerning the effect of topology on electrical switching in chalcogenide network glasses, Phys. Rev. B 54 (1996) 4413-4415. **	



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Group Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned
Attorney Docket Number	M4065.0564/P564-A

CN4	Neale, R.G.; Aselfine, J.A., The application of amorphous materials to computer memories, IEEE transactions on electron dev. Ed-20 (1973) 195-209. **
CO4	Ovshinsky S.R.; Fritzsche, H., Reversible structural transformations in amorphous semiconductors for memory and logic, Metallurgical transactions 2 (1971) 641-645. **
CP4	Ovshinsky, S.R., Reversible electrical switching phenomena in disordered structures, Phys. Rev. Lett. 21 (1968) 1450-1453. **
CQ4	Owen, A.E.; LeComber, P.G.; Sarrabayrouse, G.; Spear, W.E., New amorphous-silicon electrically programmable nonvolatile switching device, IEE Proc. 129 (1982) 51-54 **
CR4	Owen, A.E.; Firth, A.P.; Ewen, P.J.S., Photo-induced structural and physico-chemical changes in amorphous chalcogenide semiconductors, Phil. Mag. B 52 (1985) 347-362. **
CS4	Owen, A.E.; Le Comber, P.G.; Hajto, J.; Rose, M.J.; Snell, A.J., Switching in amorphous devices, Int. J. Electronics 73 (1992) 897-906. **
CT4	Pearson, A.D.; Miller, C.E., Filamentary conduction in semiconducting glass diodes, App. Phys. Lett. 14 (1969) 280-282. **
CU4	Pinto, R.; Ramanathan, K.V., Electric field induced memory switching in thin films of the chalcogenide system Ge-As-Se, Appl. Phys. Lett. 19 (1971) 221-223. **
CV4	Popescu, C., The effect of local non-uniformities on thermal switching and high field behavior of structures with chalcogenide glasses, Solid-state electronics 18 (1975) 671-681. **
CW4	Popescu, C.; Croitoru, N., The contribution of the lateral thermal instability to the switching phenomenon, J. Non-Cryst. Solids 8-10 (1972) 531-537. **
CX4	Popov, A.I.; Geller, I.KH.; Shemetova, V.K., Memory and threshold switching effects in amorphous selenium, Phys. Stat. Sol. (a) 44 (1977) K71-K73. **
CY4	Prakash, S.; Asokan, S.; Ghare, D.B., Easily reversible memory switching in Ge-As-Te glasses, J. Phys. D: Appl. Phys. 29 (1996) 2004-2008. **
CZ4	Rahman, S.; Sivarama Sastry, G., Electronic switching in Ge-Bi-Se-Te glasses, Mat. Sci. and Eng. B12 (1992) 219-222. **
CA5	Ramesh, K.; Asokan, S.; Sangunni, K.S.; Gopal, E.S.R., Electrical Switching in germanium telluride glasses doped with Cu and Ag, Appl. Phys. A 69 (1999) 421-425. **
CB5	Rose, M.J.; Hajto, J.; Lecomber, P.G.; Gage, S.M.; Choi, W.K.; Snell, A.J.; Owen, A.E., Amorphous silicon analogue memory devices, J. Non-Cryst. Solids 115 (1989) 168-170. **
CC5	Rose, M.J.; Snell, A.J.; Lecomber, P.G.; Hajto, J.; Fitzgerald, A.G.; Owen, A.E., Aspects of non-volatility in a -Si:H memory devices, Mat. Res. Soc. Symp. Proc. V 258, 1992, 1075-1080. **
CD5	Schuocker, D.; Rieder, G., On the reliability of amorphous chalcogenide switching devices, J. Non-Cryst. Solids 29 (1978) 397-407. **
CE5	Sharma, A.K.; Singh, B., Electrical conductivity measurements of evaporated selenium films in vacuum, Proc. Indian Natn. Sci. Acad. 46, A, (1980) 362-368. **
CF5	Sharma, P., Structural, electrical and optical properties of silver selenide films, Ind. J. Of pure and applied phys. 35 (1997) 424-427. **
CG5	Snell, A.J.; Lecomber, P.G.; Hajto, J.; Rose, M.J.; Owen, A.E.; Osborne, I.L., Analogue memory effects in metal/a-Si:H/metal memory devices, J. Non-Cryst. Solids 137-138 (1991) 1257-1262. **
CH5	Snell, A.J.; Hajto, J.; Rose, M.J.; Osborne, L.S.; Holmes, A.; Owen, A.E.; Gibson, R.A.G., Analogue memory effects in metal/a-Si:H/metal thin film structures, Mat. Res. Soc. Symp. Proc. V 297, 1993, 1017-1021. **
CI5	Steventon, A.G., Microfilaments in amorphous chalcogenide memory devices, J. Phys. D: Appl. Phys. 8 (1975) L120-L122. **
CJ5	Steventon, A.G., The switching mechanisms in amorphous chalcogenide memory devices, J. Non-Cryst. Solids 21 (1976) 319-329. **
CK5	Stocker, H.J., Bulk and thin film switching and memory effects in semiconducting chalcogenide glasses, App. Phys. Lett. 15 (1969) 55-57. **
CL5	Tanaka, K., Ionic and mixed conductions in Ag photodoping process, Mod. Phys. Lett B 4 (1990)



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Group Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned

Attorney Docket Number M4065.0564/P564-A

	1373-1377. **
CM5	Tanaka, K.; Iizima, S.; Sugi, M.; Okada, Y.; Kikuchi, M., Thermal effects on switching phenomenon in chalcogenide amorphous semiconductors, Solid State Comm. 8 (1970) 387-389. **
CN5	Thornburg, D.D., Memory switching in a Type I amorphous chalcogenide, J. Elect. Mat. 2 (1973) 3-15. **
CO5	Thornburg, D.D., Memory switching in amorphous arsenic triselenide, J. Non-Cryst. Solids 11 (1972) 113-120. **
CP5	Thornburg, D.D.; White, R.M., Electric field enhanced phase separation and memory switching in amorphous arsenic triselenide, Journal(??) (1972) 4609-4612. **
CQ5	Tichy, L.; Ticha, H., Remark on the glass-forming ability in Ge <sub>x</sub> Se <sub>1-x</sub> and As <sub>x</sub> Se <sub>1-x</sub> systems, J. Non-Cryst. Solids 261 (2000) 277-281. **
CR5	Titus, S.S.K.; Chatterjee, R.; Asokan, S., Electrical switching and short-range order in As-Te glasses, Phys. Rev. B 48 (1993) 14650-14652. **
CS5	Tranchant,S.;Peytavin,S.;Ribes,M.;Flank,A.M.;Dexpert,H.;Lagarde,J.P., Silver chalcogenide glasses Ag-Ge-Se: Ionic conduction and exafs structural investigation, Transport-structure relations in fast ion and mixed conductors Proceedings of the 6th Riso International symposium. 9-13 September 1985. **
CT5	Tregouet, Y.; Bernede, J.C., Silver movements in Ag <sub>2</sub> Te thin films: switching and memory effects, Thin Solid Films 57 (1979) 49-54. **
CU5	Uemura, O.; Kameda, Y.; Kokai, S.; Satow, T., Thermally induced crystallization of amorphous Ge <sub>0.4</sub> Se <sub>0.6</sub> , J. Non-Cryst. Solids 117-118 (1990) 219-221. **
CV5	Uttecht, R.; Stevenson, H.; Sie, C.H.; Griener, J.D.; Raghavan, K.S., Electric field induced filament formation in As-Te-Ge glass, J. Non-Cryst. Solids 2 (1970) 358-370. **
CD5	Viger, C.; Lefrancois, G.; Fleury, G., Anomalous behaviour of amorphous selenium films, J. Non-Cryst. Solids 33 (1976) 267-272. **
CX5	Vodenicharov, C.; Parvanov,S.; Petkov,P., Electrode-limited currents in the thin-film M-GeSe-M system, Mat. Chem. And Phys. 21 (1989) 447-454. **
CY5	Wang, S.-J.; Misium, G.R.; Camp, J.C.; Chen, K.-L.; Tigelaar, H.L., High-performance Metal/silicide antifuse, IEEE electron dev. Lett. 13 (1992)471-472. **
CZ5	Weirauch, D.F., Threshold switching and thermal filaments in amorphous semiconductors, App. Phys. Lett. 16 (1970) 72-73. **
CA6	West, W.C.; Sieradzki, K.; Kardynal, B.; Kozicki, M.N., Equivalent circuit modeling of the Ag As0.24S0.36Ag0.40 Ag System prepared by photodissolution of Ag, J. Electrochem. Soc. 145 (1998) 2971-2974 **
CB6	West, W.C., Electrically erasable non-volatile memory via electrochemical deposition of multifractal aggregates, Ph.D. Dissertation, ASU 1998 **
CC6	Zhang, M.; Mancini, S.; Bresser, W.; Boolchand, P., Variation of glass transition temperature, T <sub>g</sub> , with average coordination number, $\langle m \rangle$ , in network glasses: evidence of a threshold behavior in the slope $ dT_g/d\langle m \rangle $ at the rigidity percolation threshold ( $\langle m \rangle=2.4$ ), J. Non-Cryst. Solids 151 (1992) 149-154. **

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